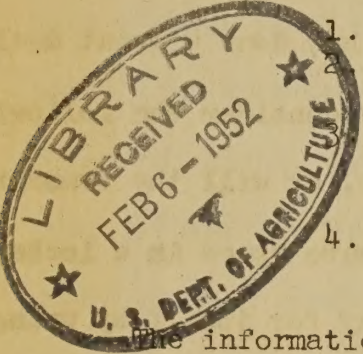


October 1951^{5c}

3 ✓ HOME FREEZER FACTS
(First In a Series) "

There are still many families today considering whether or not to buy a home freezer. This is the first of four articles which we hope will be helpful in answering the following four questions:

- 
1. Shall we buy a home freezer?
 2. What style home freezer shall we buy - vertical or horizontal?
 3. What operating features shall we look for, and what kind of guarantees and service can we expect on home freezers?
 4. Shall we buy a home freezer with a separate freezing compartment?

The information assembled to answer these questions was furnished by Dr. Earl McCracken of USDA's Bureau of Human Nutrition and Home Economics. The answer to the first question, he says, depends on the individual family. Dr. McCracken suggests several points to consider.

From the standpoint of satisfaction -- and if there is no other source of supply of frozen food -- undoubtedly it's a good idea. For the family that raises much of its own food, a freezer furnishes the means of preserving part of it, and brings garden freshness to the family table throughout the year. Freezing retains bright color, fresh flavor, and most of the vitamin values of fresh foods. There is no other known method of preserving food so nearly in its natural fresh state. And, while it is doubtful that there is an actual cash saving, the use of frozen foods often provides better eating

One angle to be considered is whether or not space in a locker plant will solve the frozen food problem just as well. There are a larger number of plants in use and it would be easy for a family to check the charges if there's such a plant nearby. The cost of locker space, charge for preparing

2-Home Freezer Facts

the food for freezing, and the charge for the actual freezing should be considered. After it has been decided what and how much food is to be frozen, the total cost of preserving it in a locker plant can be closely estimated for purposes of comparison with the cost of freezing and storing food in a home freezer.

Now we come to the cost of owning a home freezer. The initial cost will be roughly dependent on its size. Dr. McCracken, who has done a great deal of research on home freezers, suggests that the family consider the following questions: Will much actual freezing of foods be done, or will the freezer be used primarily for storage? Will the family also have space in a locker plant? Will an attempt be made to make the freezer pay for itself by using it for most of the family food supply, or, perhaps, by freezing some surplus food for sale? Depending on all these factors, the size of the freezer needed may be from 1 to 10 to 12 cubic feet per person. An average of 5 to 6 cubic feet per person may generally be used as a guide.

Another topic which will come into this discussion is how much a freezer will hold. They're rated on a basis of cubic feet, but this really doesn't mean much, the experts tell us. The kind of food and the type of packages are the determining factors here. For instance, while a cubic foot of space will hold up to 40 pounds of packaged ground meat, only around 10 pounds of bakery goods, (such as cakes and pies) will go into this same space. The cubic-foot poundage of other kinds of food ranges between these two. A cubic foot is about $\frac{4}{5}$ of a bushel, so a 15-cubic foot freezer would hold about 12 bushels of processed food.

The length of time frozen foods will keep is another important consideration. If properly prepared and stored frozen foods maintain their quality for

3-Home Freezer Facts

as long as 8 to 12 months. This is because the organisms that cause spoilage are not active at zero, the temperature at which frozen food should be stored. However, it is wise to plan ahead and freeze only as much of the different foods as the family will use during the year.

Home freezers are still so new we do not know their average life. It is probably safe to figure depreciation costs on a life of ten years. Neither have average yearly expenditures for repairs been established, but estimates place this at about 2 percent of the initial cost. Operational costs will vary, of course, with size, kind of use, and the location of the freezer in the home. These can be estimated only very roughly. A 20-cubic foot freezer, under average conditions, would require around 140 kilowatt hours per month. This figure, multiplied by the electric rate, will give the monthly cost of operation. Of course, the smaller freezers will use less kwh than the larger ones. The cost of packaging material is an important item. Proper materials for packaging are a necessity in obtaining good results. Makeshift materials should not be used. Even when outer containers can be used over a few times, the average cost of packaging will run a little more than one cent per pound of frozen food. Then, from the number of pounds estimated to be placed in the freezer in a year, the cost per pound of freezer food can be determined.

In summing up, here are some other points Dr. McCracken suggests for consideration. Against the financial outlay for a home freezer, the family should balance such items as these: the satisfaction obtained from eating frozen fresh foods the year around, their palatability and nutritive value, and the opportunity a freezer gives for saving some food that might otherwise be wasted.

In the second article, to follow soon, we'll discuss the relative merits of the vertical and horizontal styles of freezers.

HOME FREEZER FACTS
(Second in a Series)

This is the second in a series of four articles designed to help rural families select a home freezer. Information for the articles was provided by Dr. Earl McCracken of the Bureau of Human Nutrition and Home Economics of the U. S. Department of Agriculture.

The first of the series discussed the question -- shall we buy a home freezer? It pointed out that from the standpoint of satisfaction, frozen food offers a great deal. Freezing retains bright color, fresh flavor, and most of the vitamin values, and often provides better eating for the family. Dr. McCracken stated that while freezing does not necessarily effect any saving in money, it does sometimes offer a means of preserving food which might otherwise be wasted.

The article went on to discuss the cost of the freezer, of its operation, and of good packaging materials, and also stated the approximate quantities of different foods it would hold.

The second question to be considered is -- what style home freezer shall we buy, vertical or horizontal?

Several factors govern the answer to this question. Where is the freezer to be placed? There are freezers of different dimensions, but one dimension is limited by the size of the opening through which it must be taken. Is it to go down a stairway -- around a corner -- under an archway? Even if it will fit in the place you have picked for it, can you get it there? Is the floor strong enough to support it? A freezer is heavy even when empty, and becomes much heavier when filled. A vertical freezer will rest on a smaller **surface** than a horizontal freezer of the same capacity, and so it will exert more pressure per square foot of floor area. It may need planks placed underneath to distribute the weight over a greater area.

2-HOME FREEZER FACTS (Second Series)

Now let us consider the relative advantages and disadvantages of the vertical (upright) and horizontal (chest) types of freezer. Dr. McCracken, after his research on home freezers, points out several things to be considered. Even though the upright freezer doesn't require as much floor space as a horizontal one of the same capacity, some floor space must be allowed for the door or doors to swing open. One good feature of the horizontal type is that if the top is relatively flat, it can be used as a work surface. (This, perhaps, is of no consequence unless the freezer is located in or near the kitchen.)

From the convenience-in-use standpoint, the choice will be one of personal preference. For example, vertical freezers tend to frost more than those of the other type but on the whole are a little easier to defrost. Initial feeling that a vertical freezer would be more convenient should be considered in the light of its use as a freezer with all shelves packed full, rather than as a refrigerator with the objects at the rear fairly accessible over the tops of those at the front of the shelves. If the freezer is full, there's no convenient place to put the packages at the front while getting those at the rear, as there is in the horizontal type freezer while getting packages from the bottom layer. Drawers in the vertical freezer avoid this difficulty, but waste some of the storage space. Baskets in the horizontal type make it easier to get at the food at the bottom of the storage space -- provided a person can lift the loaded baskets. These baskets also are wasteful of storage space, of course. In any case, in looking at freezers of different designs, try reaching to all places where packages can be stored, and imagine trying to get at them if the freezer were full.

3-HOME FREEZER FACTS (Second Series)

Manufacturing has progressed to the point where it's doubtful that one can say all vertical freezers of a certain size will cost more to operate because of higher electric energy consumption than all horizontal ones of the same size. However, it is safe to say that, if the construction are identical, a vertical freezer will cost no more to operate than a horizontal one. Manufacturers making the vertical type have recognized certain limitations and have built their freezers accordingly. As a result, in general, a vertical-type freezer will cost a little more to buy than a horizontal one of the same capacity.

And here's an idea to which some thought should be given -- the purchase of two freezers of medium capacity rather than one of large size. For instance, two 10-foot freezers might be better than one 20-cubic-foot freezer. The first cost would be greater, of course, but when the food supply is reduced by one-half, one freezer could be shut off. Part of the time one could be used for freezing and the other for storage. In case of breakdown of one of the freezers, the whole supply of frozen food would not be endangered. If the freezer purchased is found to be too small for the purposes desired, serious thought should be given to the purchase of a second freezer, instead of trading the first one in on a larger size.

In the next article of this series on the selection of a home freezer, we'll give you further results of Dr. McCracken's investigations of the various freezers.

HOME FREEZER FACTS
(Third In a Series)

This is the third in a series of four articles designed to help rural families select a home freezer. Information for the articles was provided by Dr. Earl McCracken of the Bureau of Human Nutrition and Home Economics of the U. S. Department of Agriculture.

In the first installment of this series, the satisfaction of using frozen foods was noted -- the fact that freezing helps to retain the bright color, fresh flavor, and most of the vitamin values. The point was made that a family freezer often affords an opportunity for preserving food which might otherwise go to waste. The cost of owning and operating a freezer was discussed, and an estimate made of the quantities of different foods it would hold.

The second article of the series presented the pros and cons of the two different styles, the upright and the chest models. The location of the freezer in the home also was discussed.

Question number 3 is this: What operating features should we look for, and what kind of guarantees and service can we expect on home freezers?

Many factors are involved in the answer to this double-headed question. The features that most influence the operating characteristics of a freezer cannot be seen. For instance -- how efficient is the refrigerating mechanism? How good is the insulation? Is the vapor seal adequate? How rugged is the construction? While freezers now on the market are not as likely to become "orphans" as have many in the past, it still is advisable to buy from an established manufacturer of home or farm equipment -- or from a local dealer with a reputation for reliability and honest dealing. Freezer guarantees are much the same as those for household refrigerators. The whole freezer is guaranteed (with the usual exceptions for abuse, etc.) for one year against

2-HOME FREEZER FACTS (Third Series)

defects in materials or workmanship, and the refrigeration unit for five years.

The question of servicing facilities is important too. Freezers operate under more severe conditions than the standard type household refrigerator, and more need for servicing can be expected. At least until the industry has had several more years of manufacturing experience. It can be expected that designs, models and construction will be developed which will not require any more servicing than standard household refrigerators now require. At present, it's advisable to buy a freezer made by a manufacturer who maintains nearby servicing facilities. Next best is a dealer having adequate facilities for servicing, and who also has arrangements for handling your frozen food in case of major difficulty.

Here is some information on the mechanism of home freezers based on a study of various types by Dr. Earl McCracken of USDA's Bureau of Human Nutrition and Home Economics.

Wall Insulation

Because of dimension limitations, four inches seems to be the accepted thickness, and it should be of a recognized type such as cork, rock wool, glass wool, plastic, etc. Literature should describe the type of insulation and the way it is assembled into the cabinet. There is no adequate, sure, short-time test of vapor seal. However, in checking with the dealer on the construction of a freezer, find out what measures have been taken to establish a vapor seal between the outer liner and the insulation to prevent moisture from entering the insulation. If careful precautions in this regard are not taken, the efficiency of the insulation can be reduced in a relatively short time to the point where it's of little value. Then the freezer will begin to operate excessively and even continuously, and even then

3-HOME FREEZER FACTS (Third Series)

Compressor Units

Most compressor units will perform satisfactorily, but that is no guarantee of good refrigeration results. The freezer should have the correct amount of cooling refrigerated surface in the box to produce the desired temperature without having these surfaces at excessively low temperatures, such as 20 or 30° F below zero. In addition to being hard on the compressor, these excessively low temperatures tend to dry out the food in the freezer. Everything else being equal, the freezer having the larger cooling surface for the same size compressor is to be preferred.

Compressor units are of two types, (1) the open and (2) the closed or sealed unit. In the open type, the compressor is run by a belt from the motor. (Two belts are a little added insurance of continuous performance.) This unit generally has a fan attached to the motor shaft to force air through the condenser. In the "sealed unit," the motor and compressor are in the same housing and sealed in oil. A separate motor runs the fan for the condenser. The open-type unit gives slightly better operating efficiency, and can be serviced without returning it to the factory. It has the disadvantage, however, of requiring oiling, and of possible belt failure and replacements. The "sealed" unit is quieter in operation, does not require oiling and is considerably more compact. In case of trouble, however, the unit has to be returned to the factory for repairs. The trend in home freezers of the sizes most families will buy is toward "sealed" compressor units. In fact, most home freezers today are of the closed type.

If you get a freezer with "sealed" unit, find out what service facilities are available locally, or what arrangements can be made for taking care of your frozen food if the unit has to be sent back to the factory.

4-HOME FREEZER FACTS (Third Series)

No definite statement can be made as to the size of compressor unit required for a freezer of given capacity. Even manufacturers are of different opinions, brought about, no doubt, by the designs of their various freezers and the purposes for which they expect them to be used. Different makes of 20-cubic-foot freezers use motors ranging from $\frac{1}{4}$ to $\frac{1}{2}$ horsepower. In general, motors of $\frac{1}{8}$ to $\frac{1}{4}$ horsepower are used on freezers from 3 to 20 cubic feet, and $\frac{1}{4}$ to $\frac{1}{2}$ horsepower for those from 15 to 30 cubic feet. This gives considerable overlapping in the 15 to 20 cubic-foot range. The ones with the larger motors can be expected to have the greater reserve capacity.

As for the refrigerant, no choice is offered to the purchaser of a home freezer. Freon-12 is commonly accepted as the best for this use.

We'll take up the subjects of the freezing compartment, temperature adjustment and location of the freezer in the next article in this series.

HOME FREEZER FACTS
(Fourth In a Series)

This is the final article in a series of four designed to help rural families select a home freezer. Information for the articles was provided by Dr. Earl McCracken of the Bureau of Human Nutrition and Home Economics of the U. S. Department of Agriculture.

The first article presented the different reasons for buying a home freezer -- the satisfaction of using frozen foods because of their fine flavor and color, and the retention of vitamin values -- and also discussed the cost of owning and operating a freezer.

The second article presented the pros and cons of the two different styles of home freezer, the upright and the chest models. This also covered the question of the location of the freezer in the home.

The third installment in the series discussed various operating features of a freezer, especially those which cannot be seen, and comparison was made between the open and sealed compressor units. The importance of servicing facilities, in case of breakdown, also was stressed. The fact was emphasized that it is well to buy from an established manufacturer of home or farm equipment, or from a reliable local dealer, who also has servicing facilities.

Now, finally, we consider the question -- shall we buy a home freezer with a separate freezing compartment. Dr. McCracken says not necessarily. In freezers of the 18-cubic foot size, or larger, it's usually desirable that there be a separate compartment. A family buying one of this size would doubtless be planning on doing considerable freezing. When food to be frozen is placed in the same compartment with frozen food, the temperature of the frozen food rises. If the temperature rise is much above zero and occurs frequently, the period over which the food can be kept in first class condition is materially shortened. A separate freezing compartment eliminates

2-HOME FREEZER FACTS (Fourth Series)

or greatly reduces this rise of temperature in the frozen food. The design of the freezer and the reserve capacity of the compressor are vital factors also in preventing or reducing temperature rise during freezing. In every case there **should** be some provision for keeping food being frozen from coming in contact with that already frozen and in storage.

In the upright freezers, nearly always the cooling plates are the shelves. There is an extra cooling plate in the top of the compartment to cool the warm air that rises to the top. Usually there is no cooling plate at the bottom of the storage space.

Chest-type freezers either use upright cooling plates (lengthwise or crosswise of the storage space, thereby acting as dividers) or the walls are **cooled** by coils on the back. If there is a separate freezing compartment, the bottom as well as the walls of this compartment is generally cooled. A few freezers cool part or all of the bottom of the storage compartment. In general, the freezer with the greater amount of cooling surface is to be preferred.

Because of the lower temperature, heat leakage around the doors is more of a problem than it is in household refrigerators. More attention must be paid to that part of the construction. In a chest-type freezer, the weight of the door or lid can be used to help in preventing heat leakage. This, however, makes opening the lid difficult for children or frail people, and there's always the danger of the lid falling shut and injuring the user. If the lid itself is made light, or is counterbalanced to make opening easier, some sort of latch should be used that in closing will put pressure on the lid gasket to give a good seal. This is now the more common method used on chest-type freezers, and the only method on upright freezers. Some of these

3-HOME FREEZER FACTS (Fourth Series)

latches have a hole through the two parts (on lid and body) so that a lock operated by a key can be used to prevent theft. Whenever there is a leak around the door, lid or elsewhere, water vapor will enter the freezer and condense on the cold surfaces. Some freezers have single door or lid gaskets and others have double gaskets. In general, a single gasket is to be preferred.

For best performance, a freezer should be placed in a cool, well-ventilated location, but not where the temperature is expected to go much below freezing. A damp location will cause continued condensation, possibly even resulting in pools of water on the floor around the freezer. This will hasten the rusting of hinges, latches and other hardware, as well as the metal of the freezer cabinet and compressor assembly. Since a freezer should be opened only once or twice a day, it needn't be in or close to the kitchen but it should be conveniently located.

A good safety precaution is to ground the frame, particularly if it's in a damp place, or if considerable sweating occurs. The motor should have an overload cut out switch.

The temperature of the freezer should be adjustable. The manufacturer's directions should be followed in adjusting the temperature control. No standard method of determining the temperature in freezers has been established. The temperature at the center tells nothing as to the temperature above or below it, or toward a side or end. Compartments often have different temperatures. It's wise to ask how much temperature difference there is throughout the freezer when it's in operation, and whether or not it will maintain zero at all places where food can be located.

4-HOME FREEZER FACTS (Fourth Series)

Freezers warm up when the compressor quits operating. An alarm to warn when the temperature rises above normal is worth having.

Dr. McCracken makes several final suggestions about features worth looking for in selecting a home freezer. These are: toe space under the edge, for convenience in working around the freezer; smooth lids and sides with few ridges or creases, and rounded interior corners, for ease in cleaning; interior free of unnecessary ridges for ease in defrosting and cleaning; easily opened and easily latched doors; an interior light; and of course, if the freezer is to be placed where it will be seen often a pleasing outside finish is desirable.